my research and history

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28 PUBLICATIONS **4** CITATIONS

Photo of wanli wang

Born data

Man, Born in 05-Feb-1961 in Anshun city of Guizhou province of China

Feb-1978—Feb-1982

Study the meteorology in Yunnan university during Feb-1978—Feb-1982, and then Graduated from the Meteorology Department of Geophysics College of Yunnan University and endowed Bachelor of Science Degree in Feb-1982.

Feb-1982—Jun-1989

Employed as a teacher of meteorology in Meteorological School of the Bureau of Guizhou Province in China during Feb-1982—Jun-1989,during which, having become lecture of meteorology.

Sep-1987—July-1988

Training in English group in meteorological College of Nanjing with curriculum of courses of Oral English, Writing English, Listening English, and Extensive Reading English, Then with the Certificate of Completion in July of 1988

Sep-1988—July-1989

Employed as the staff of Meteorological Observatory of Guizhou Province of China.

Sep-2002—July-2005

Study the Geophysics in Yunnan university during Sep-2002—July-2005, and then Graduated from the Geophysics Department of Geoscience College of Yunnan University With Master of Science Degree

Jun-1989—Sep-2002

The staff of Wuhan Observatory of Meteorology in Hubei province in China

Sep-2007

Recruit and enter Wuhan University for environmental science as Doctor of Wuhan University in Hubei Province,China

1991 during in Wuhan Observatory

Begun to put forward to the new concept model of “zonal balance state in atmosphere” with assumption that east-west(zonal) wind may be supposed to be as constant or no-variation, then calculate how many of angular momentum of earth in high latitude or low latitude by conveyance of south-north(meridian) wind (precisely the projection on the direction of south-north from surface wind) ,the quantity of angular momentum conveyance is with positive or negative sign, for example, using the quantity of angular momentum conveyance with positive or negative sign , and then to make the map of this quantity distribution on 850 hPa, via the this map the precipitation area especially “heavy rain position” can be diagnosed by this map, the quantity of angular momentum conveyance with positive or negative sign is evaluated by below formula

$$\begin{aligned} -\Delta M &= \Omega R_{e\ circle-1}^2 - \Omega R_{e\ circle-2}^2 \\ &\approx \Omega R_e^2 \left\{ \cos^2 \varphi_1 - \cos^2[\varphi_1 - \frac{Vt\cos\lambda}{\frac{2\pi R_e}{360}\times 10^3}] \right\} \end{aligned} \qquad (1)$$

Here $\frac{2\pi R_e}{360} \approx 111.19164(kilometer/\deg ree)$

So formula above is approximately show as below

$$\begin{aligned} \Delta M &= -[\Omega R_{e\ circle-1}^2 - \Omega R_{e\ circle-2}^2] \\ &\approx -\Omega R_e^2 \left\{ \cos^2 \varphi_1 - \cos^2[\varphi_1 - \frac{Vt\cos\lambda}{111\times 10^3}] \right\} \end{aligned} \qquad (2)$$

The negative sign (-) in left side of formula (1) or in right side of formula (2) is used to indicate that particle in atmosphere lost (*obtain*) angular momentum when it move northward (*southward*) ,in other words, the particle lost (get) the angular momentum $\triangle M$ is with negative sign “-“ (with positive sign ”+”),corresponding to, the particle will go to

relatively small (bigger) circle on earth surface .

R_e is the radius of earth; $\triangle M$ is variable term of angular momentum of earth, Ω is rotation angular speed of earth itself; φ_1 is the latitude degree of observatory ; V is observable horizontal speed in some observatory at some level , for example at 850 hPa, *t* is time period, such as, 24 hours or 12 hours; λ is the azimuth of observed wind, arrange from 0 degree to 360 degree, due north direction is λ with 0 degree, here means coming from north or moving to southward; due south direction is λ with 180 degree , here means coming from south or moving to northward; this paper (in Chinese) was published in 1999(3) or 18(3) of Journal of Huazhong Agricultural University.

Jun-2009—until now

Employed as the member of the staff in Wuhan Regional Climate Center of China Meteorological Administration (CMA) ,to be responsible for climate analysis and climate detection

Jan-1991—Jan-1999

The problem of the probability for the Geotrophic equilibrium began to be explored at this first stage, the Geotrophic equilibrium is explained as an exact balance between the Coriolis force and the pressure gradient force, but how many probability or what probability for this Geotrophic balance is challenge issue and created issue , at this time, the probability mathematical-physics model is needed to established, finally at this period, the basic model of probability density function(PDF) was shaped and the Variance of the probability density function(PDF) also was roughly derived successfully.

Tries and Efforts of “Zonal Balance Ideas” for Subtropical High Shift within Jan-1991—Jan-1999

During this period, the model of “zonal balance” of Subtropical High south-north Shift was primarily put forward; it was primarily deducible that the south-north temperature gradient and perpendicular temperature gradient of atmospheric temperature distribution field both put impact closely on the south-north displacements of Subtropical High. In addition, the conclusion above was still developed at the stage of manuscript.

Jan-2000—Jan-2007

In this time interval, the model of “zonal balance ” of Subtropical High south-north Shift was further elaborated explicitly so that some better results can show that 1, the Ridge of Subtropical High will be approximately 29 latitude degree if the south-north temperature gradient near to smaller or extremely zero, around this latitude degree the Ridge of Subtropical High oscillate seasonally;2, the two main Dimensionless Number was deduced successfully which entirely control south-north displacement of Subtropical High;3,the two main Dimensionless Number is consist of the rate of the atmospheric vertical heat expansion force to gravity ***G*** and the rate of atmospheric south-north heat expansion force to large-scale Geotrophic deflecting force of $f\Omega R_e$, respectively, here *f* Coriolis parameter, Ω is rotation angular speed of earth, R_e is the radius of earth; 4,the size of east-west (zonal) wind shear can influence on south-north displacements of Subtropical High, specifically, The more distance or size is bigger for south-north shifts of Subtropical High ,The more value of east-west (zonal) wind shear is bigger; 5, east wind belt of south side of Subtropical High and west wind belt of north side of Subtropical High both can lead to the south-north movement of Subtropical High, therefore, the temperature field of south side of Subtropical High is also able to let Subtropical High moves on the direction of south-north, in particular, the temperature gradient at south side of Subtropical High put south-north shifts of Subtropical High with more much amplitude than that of the north side of Subtropical High does.

Jun-2005

With the titled “***Possible Law of South-North Shifts of Subtropical High in the Zonal equilibrium and Analysis Method*** ”, with this paper(in Chinese), the Master Science Degree for Geophysics was obtained from the Geophysics College of Yunnan University, as well as , Graduate and Master programme was finished in Yunnan University.

Jun-2006

The paper (in Chinese) with the title of “ ***Variance analysis of Geostrophic static equilibrium process and L Probability Distribution Function*** ” was published at Journal of Yunnan University at Sep-2006,28(***5***), in which, the model of probability for the Geotrophic equilibrium had been remarkably developed well ,whereby, the Probability Density Function (PDF) in the model of probability for the Geotrophic equilibrium is formally names as L Probability Distribution Density Function ,or briefly called as “L

Distribution", in addition, some conclusion was further elaborated explicitly, such as, the ***m-th moment*** for "L function " ; ***The distribution function*** is successfully deduced, therefore, The calculating formula of probability in any interval（θ_1,θ_2）is obtained, this means that this formula enable anyone to evaluate the value of what probability happened in any interval in defined area; specifically, Coefficient of kurtosis equal to 0.24 ; Third moment is zero as well as Coefficient of skew is also equal to zero etc ; after all, overall and basic qualities for "L function " was illuminated in this paper beside its ***Standard deviation*** and ***Variance*** etc.

Oct-2008

The paper (abstract) titled with ***"On zonal shift of subtropical high in conservative absolute vorticity context"*** was contributed to "the fourth WMO international workshop on monsoon (IWM-Ⅳ)", Beijing,October,2008, this paper (abstract) was compiled into " abstracts of papers for the fourth WMO international workshop on monsoon (IWM-Ⅳ) ", 232-page,in my this paper (abstract),it is emphasized that east-west temperature gradient is main factor or drive force to make east-west displacements of Subtropical High , of course, the vertical temperature gradients also can influence the east-west(zonal) shift of Subtropical High, particular in this paper，it was pointed firstly out that the south-north (meridian) wind shear is also a vital factor to be impact on east-west (zonal) shift of Subtropical High.

Jun-2006

Titled paper (abstract) of "Possible Law of Activity of Ridge of Subtropical High in Postulate Zonal Equilibrium" was edited into the proceeding of the conference of 2006 ESSP, PS36/P14,702 page,Nev-2006, Beijing, below is full content of the paper (abstract)

"This paper is aimed at searching for formula of ridge of subtropical high so as to realize some profound mechanism of how to high behave and finally evaluate accurately position of the ridge .The formula is deduced from the mathematical and physical model which is called postulate Zonal Equilibrium that is utilized to emphasize significant meridian difference of physics quality over scale of hemisphere from basic equations including Integral Equation of Angular Momentum Balance .Geostrophic Equilibrium Equation. Thermal-Wind Equation. Static Equilibrium Equation and Equation of State hinging on important hypothesis about three zonal wind u cases. Respectively u=0.u =constant and u variation with temperature and pressure field .Result finally is $\phi = 1/2[1 + R^2(T_n - T_0)\Delta T / \Omega R_e^2 \Phi f]$.Here ϕ is value of latitude of position of the ridge.

Unit is known as radian. Φ is gravitational potential. f is known as Coriolis parameter. ΩR_e^2 is known as earth angular momentum at equator. R is known as gas constant. $(T_n - T_0)$ is vertical temperature contrast. ΔT is horizontal temperature discrepancy from north to south . $R^2(T_n - T_0)\Delta T / \Omega R_e^2 \Phi f$ is a Non-dimensional number or also is indicated as $u/\Omega R_e$. u is zonal mean wind. R_e is radius of earth. Conclusions (1) ridge of subtropical high oscillates around 30 latitude.(2) Meridian and perpendicular temperature gradient simultaneously drive the ridge movement （3）In the context ΔT ＜0 .=the temperature of south higher than north .Once the gradients both obvious. Then the ridge jump to south from north and vice versa. But if under of condition of $\Delta T >$ 0 .All effect also vice versa again. if ΔT and $(T_n - T_0)$ both equal zero so Φ value is just 30 degree or so（4）Generally $(T_n - T_0) < 0$.if $\Delta T > 0$ the ridge will slop to pole-ward along with ascending of pressure surface. Similarly, If ΔT ＜0.The ridge will lean forward equator. This mathematical and physical model can help our better understanding of some of the main features of subtropical high."

Aus-2009

The paper named as "Two dimension larger-scale stability and subtropical high meridian Behaviors" was edited into Poster session presentations: Climate Science of the World Climate Conference-3, hold in Geneva, Switzerland, 31 August – 4 September 2009, And financed by WMO to participate into the World Climate Conference-3,in this paper, it was firstly shown that north boundary(5880 contour) of Subtropical High obviously had shifted toward to high latitude (pole-ward) in recent 50 years due to the decrease in south-north temperature gradient or due to becoming smaller of pole-equator temperature different. Which in return exacerbate globe warming, especially worsen situation of extreme climate, Such as floods, hot extreme wave, severe droughts, super typhoon and hurricane, even short heavy rainfall etc?

Sep-2009

The paper (abstract) of "Two Dimension Larger-Scale Stability and Subtropical High Zonal Behaviours " was formally published at the 2009 Annual Conference of Europe Meteorology society, dynamic session, vol. 6，EMS2009-104, hold in Toulouse,France, 28-Sep-2009. this paper (abstract) also was then compiled into The the Smithsonian Astrophysical Observatory (SAO)/NASA Astrophysics Data System (ADS) , in which, it is

firstly shown that $f\Phi = const$ under condition of Thermal Wind Balance,here *f* Coriolis parameter, Φ is gravitational potential, via this notion, it can be explained why pole-ward flow corresponding roughly to ascent motion and equator-ward flow corresponding roughly to descent motion, so dynamic different between east portion and west portion of Subtropical High is demonstrated well.

http://adsabs.harvard.edu/abs/2009ems..confE.104W

Sep-2010

The paper (abstract) of "Two Dimension Large-Scale Stability and Subtropical High Meridian Behaviors' " was formally published at the 2010 Annual Conference of Europe Meteorology society, dynamic session, 10th EMS Annual Meeting, AW1,Dynamical Meteorology ,Vol.7, EMS2010-211 , 13-17-Sept-2010 , hold in Zürich, Switzerland，in which, it is demonstrated well that Subtropical High move toward equator (***pole***) when solid earth rotates slowly (***fast***) beside expression of $f\Phi = const$,this paper (abstract) also was then compiled into the Smithsonian Astrophysical Observatory (SAO)/NASA Astrophysics Data System (ADS) ,in addition, in this paper, the averaged latitude position of long term of Subtropical High is 29 degree N or so , around this averaged latitude position the Subtropical High oscillate seasonably in south-north direction.

http://adsabs.harvard.edu/abs/2010ems..confE.211W

Sep-2011

The paper (abstract) of "***One Candidate Mechanism of Low-Frequency Oscillation - Coriolis Parameter Variance Associated with Latitude***" was formally published at the 2011 Annual Conference of Europe Meteorology society, dynamic session, EMS Annual Meeting. Vol. 8, EMS2011-67-1, 2011.11th EMS / 10th ECAM, hold in Berlin Germany, at 12-Sep-2011. In this paper, geotrophic balance oscillation physical model was combined with probability model of geotrophic balance, the probability of absolute geotrophic balance happening is zero, and probability of quasi- geotrophic balance happening is near to 70%, which is bigger probability state, however, the probability of beyond quasi-geotrophic balance is 30%,in sum, the interval probability between 1 positive Standard

deviation and 1 negative Standard deviation is 70%,this interval is called as quasi-geotrophic balance state, the interval probability between 1 positive or 1 negative Standard deviation and 2 positive or 2 negative Standard deviation is both 12%, this interval is called as no- geotrophic balance state, similarly, the interval probability between 2 positive or 2 negative Standard deviation and 3 positive or 3 negative Standard deviation is both 3%, this interval may be called as “super-no- geotrophic balance state”, in addition, the results also shows that Low-Frequency Oscillation(40-70 days) exists in tropic low latitude, two-weeks Oscillation exists in mid-latitude region; less than one week(4-5 days) Oscillation happens in high latitude region, although they propagate among of them self each other at south-north direction. Finally, this paper was presented on 11th EMS / 10th ECAM.

http://presentations.copernicus.org/EMS2011-67_presentation.pdf

https://www.researchgate.net/publication/298531278_One_Candidate_Mechanism_of_Low-Frequency_Oscillation_-_Coriolis_Parameter_Variance_Associated_with_Latitude

Sep-2012

Title of “Energy Balance in Atmospheric Circulation and Globe Warming” was formally published at the 2012 Annual Conference of Europe Meteorology society, dynamic session, 12th EMS Annual Meeting,Vol.9, EMS2012-272-1, hold in 10-Sep-2012,Lodz,Poland. In this article, it is emphasized that the relationship between gravitational potential energy and the interior energy in non-rotation atmosphere, here interior energy is in proportion to size of temperature, is just reverse linear response, in other words, the gravitational potential energy is decrease when the interior energy (averaged temperature) is increase, and vice versa, but in rotating atmosphere, the relationship between gravitational potential energy and the interior energy is just proportional nonlinear response, in sum, in rotating atmosphere of earth, the gravitational potential energy is increase when the interior energy (averaged temperature) is increase, also vice versa, even the gravitational potential energy surprisingly and prominently, sometime even extremely, increase when the interior energy (averaged temperature) is in increase, this conclusion give us better causes why the gravitational potential height at 500hPa generally and obviously raised in recent 50 years in whole globe, of course, in this paper, the relationship between some extreme weather (drought、floods、hot wave、super typhoon etc) and phenomena of the gravitational potential height increase also somewhat is demonstrated well. Finally, this paper was presented on 12th EMS / 11th ECAM.

http://presentations.copernicus.org/EMS2012-272_presentation.pdf

Sep-2013

Title of “Dynamical Different between West and East Portion of Upper Anticyclone” was formally published at the 2013 Annual Conference of Europe Meteorology society, EMS Annual Meeting Abstracts, Vol.10, EMS2013-364, 2013,13th EMS / 11th ECAM, hold in 10-Sep-2013, Reading University, London, United Kingdom, in this paper, two notion was created by author(wanli Wang): 1,the partial derivative is taken for $f\Phi=const$, then ”geopotential height – Coliris parameter partial derivation equation” is derived, like be $\Phi(\partial f/\partial x) + f(\partial\Phi/\partial x)$,here f is Coliris parameter , Φ is gravity geopotential height, using this formula to analysis the dynamic different between east part of Subtropical High and west part of Subtropical High; 2, using the balance for earth rotation between Centripetal Force and Centrifugal Force to clarify the dynamic different between pole-ward flow and equator-ward flow. Other three notions in this paper were introduced from other scientists to interpret those dynamic different. This paper was further developed and elaborated in new version on Researchgate with name “Dynamic different on Upper Anticyclone”

https://www.researchgate.net/publication/301693595_Dynamical_Different_on_Upper_Anticyclone

http://presentations.copernicus.org/EMS2013-364_presentation.pdf

23-Jul-2014

The paper (in Chinese) with title of “L Probability Distribution Function and A Theoretical Standard of Relative Dry and Wet Index” was formally published at Journal of Anhui Agricultural Science, 42(***21***), in this paper, the “L Probability Distribution Function” was primarily standardized with its random variable (*P-E*) during study of deficit between precipitation and evaporation *(P-E)*, its random variable *(P-E)* is standardized with “0-1” type into two kind of *(P-E)/E* or *(P-E)/P* ,respectively, according to the boundary condition of L Probability Density Function(PDF), f(-1)=0 and f(+1)=0, respectively, in particular, its standardized random variable is *(P-E)/E* when precipitation is less than evaporation or its standardized “0-1” random variable is less than 0;similarly, its standardized random

variable is *(P-E)/P* when precipitation is more than evaporation or its standardized “0-1” random variable is more than 0;depending on the principle above, environmental dry and wet indices could be classified as 6 levels or 12 groups, the results in this paper proved that L Probability Distribution Function is possible to possess broaden and better application in many fields.

22-Sep-2015

The article (in Chinese) with title of “L Probability Distribution Function and One Self-Comparison Theoretical Standard of Dry and Wet Index” was formally published at Journal of Anhui Agricultural Science, 43(***28***), at 22-Sep-2015, in which, L standardized Probability Distribution Function was applied into “core random variable” of “distance from averaged value of the some random variable” in time and space, those spatial and temporal variation of random variable sometimes also is called as anomaly、departure or deviation , such as, $X\text{-}X_A$, X is random variable, X_A is its mean value, then ($X\text{-}X_A$) is anomaly、departure or deviation ,next analysis is similar to previous environmental drought and wet index, according to the boundary condition of L Probability Density Function (PDF) f(-1) and f(+1), respectively, the standardized and (0-1) random variable should be divided into two kind: ($X\text{-}X_A$) / X or ($X\text{-}X_A$) / X_A , therefore, (0-1)random variable is ($X\text{-}X_A$) / X_A once random variable is less than its averaged value or (0-1)random variable is less than 0 in space and time, to the contrary, (0-1)random variable is ($X\text{-}X_A$) / X once random variable is more than its averaged value in space and time or (0-1)random variable is more than 0, finally, a set of Self-Comparison Theoretical Standard of Dry and Wet Index is established with 6 degree or 12 classes , respectively. Here it deserve emphasis that divided two kind (0-1)random variable guarantee that the distribution shape is normal shape, however, normal distribution shape can be developed into or convert into skewness distribution shape if (0-1)random variable keeps same in whole interval defined, for example, same ($X\text{-}X_A$) / X_A is used in whole interval or only one same ($X\text{-}X_A$) / X is utilized in entire interval, in short, the normal distribution shape and skewness distribution shape can change one other among of them if “the size or scale parameter” remains same.

Oct-2009

The full-text paper (in Chinese) titled with “the relationships among EI Nino 、earth rotation and southward displacements of Subtropical High ” was formally published at 26th annual conference of Chinese Meteorology Society, Oct-2009, Hangzhou, china

Sep-2012

The full-text paper (in Chinese) with title of “The View on Normalizations of Polarization Process in Material Existence——and Arguments in Polarization Phenomena of Climate and Weather” was formally published at the 2012 annual conference of China Association for Science and Technology in Sep-2012, Shijiazhuang, China

March-2012

This full-text paper (in Chinese) of “Analysis of Decade Variation of East Asia Trough and West Pacific Subtropical High in summer ” was formally published in Journal of Advances in Earth Science in March-2012,

23-Oct-2013

The full-text paper (in Chinese) titled with “Tibet Plateau (Glacier) and Subtropical High divided in summer” was formally published at 30th annual conference of Chinese Meteorology Society, 23-Oct-2013, Nanjing, china

Oct-2015

The full-text paper (in Chinese) titled with “the relationships among EI Nino 、earth rotation and eastward displacements of Subtropical High ” was formally published at 30th annual conference of Chinese Meteorology Society, Oct-2015, Tianjin , china

Jun-2016

The paper of “Standard L Probability Distribution Function” was formally published at Journal of Mathematics and Statistical Science, Delaware, USA, V0L.2, Issue 6, June 2016, in whose abstract, it is said that “The cumulative distribution function(cdf) table is very important and also fundamental tool for any distribution theory, in fact, it is enable anyone to calculate the probability between ***a*** and ***b*** after cumulative distribution function is deduced, therefore, it is very easily and conveniently to obtain the probability between ***a*** and ***b*** using distribution function table, such as $P(a \le z \le b) = F(b) - F(a)$, ……., in addition, there are different the scale parameter in two sides of mean value after the variable is standardized, two kinds of different the scale parameter is determined by the features of

limited variable and by the boundary conditions of the distribution equations……., in sum,

Here is should be stressed, until now, this mark that L distribution function has developed into new stage, and has improved a lot, and was discovered with novel and specific characteristics, and become practical and useful tool, after its standard (0-1) cumulative distribution function has been deduced, in fact, at this time L cumulative distribution function has already converted into conveniently accessible table and available tools at hand like Normal Probability Function Table does.

http://www.ss-pub.org/wp-content/uploads/2016/06/JMSS16031801.pdf

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19-Feb-2017
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